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SUMMARY

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NEW ENGINEERING TECHNIQUES

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SUMMARY TO THE PAPER "NEW ENGINEERING TECHNIQUES"

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(1) As the engineering technology is a very diversified and manysided discipline, this paper can deal only with some of its aspects, namely with machining, chipless working and welding.

(2) In machining, programme-controlled machine-tools represent a progressive technological tendency, particularly in small-lot and piece-work production. In the Czechoslovak industry the following types of programme-controlled machine-tools are produced and applied.

(3) Lathes

(a) Semi-automatic copying lathes of the SP 25, SP 31 and SPK 63 types controlled by means of punched card and stops.

(b) Lathe SN 55, turret lathe RPK 25, and vertical lathe SKJ 8A.

(4) Milling machines

(a) FB 40 V, FRO 8, FRM 6 types controlled by means of punched tape and stops with rectangular cycle.

(b) FB 32 type, with digital control, without stops, with rectangular cycle.

(c) FA 4 V type, with digital control, with continuous control of tool movement along an intricate trajectory.

(d) Plane-milling machine FRJ 5 with a digital phase system of continuous control.

(e) Vertical milling machines FA 5 V and FV 1000 with a continuous digital control system with stop motors.

(5) Other machines

(a) Co-ordinate table with automatic setting of coordinates, punched-tape controlled ISS-I.

(b) Horizontal boring and milling machine WH-100.

(6) As far as chipless working is concerned, a description is given of a technological process for producing parts with a through-hole - an original high-productivity technique. To establish this process, the following machinery is necessary:

(a) Universal automatic machines for the production of springs (0.8 to 18 mm dia.)

(b) Mechanical presses LU 63, 100, 160, 250, 400, 630, 1000.

(7) For the making of high-precision and smooth holes it is advantageous to make use of the LVI-50 pulse-press which is also

very well suited for the production of sleeve bearings with a lining of thin sheet.

(8) Welding in combination with chipless working and casting makes it possible, in the mechanical engineering industries, to go over to new, technologically advantageous design of machines and equipment to an ever increasing extent. In all countries the application of welding is on the rise. There is an effort in this country to facilitate welding to the highest degree by introducing automatic welding machines. For arc welding, the following types of automatic and semi-automatic submerged-arc welding machines are used:

(a) Universal automatic welding machine, type SUM-1000.1

(b) Universal heavy type automatic welding machine with continuous flux circulation, type SHR-1500 R

(c) Suspended automatic welding machine, type SHR-1500

(d) Welding tractor, type STK-100

(e) Automatic welding machine for staybolts, type SRK-300

(f) Automatic machine for welding of sockets for boiler chambers, type SNK-500

(g) Semi-automatic machine for CO_2-shielded welding (wires up to Ø 1,2 mm), type PSCO-2A

(h) Semi-automatic machine for CO_2-shielded welding (wires up to Ø 2,3 mm), type PSCO-3A

(j) Automatic electro-slag welding machine, type VUS-AS-4.

(9) Automatic pneumatic spot welding machines, typified series:

(a) BP-10A, -20A; -40A; are designed mostly for welding thin plain-grade steel sheets. The welding is carried out either by separate spot welds or by series of spots. The machine is controlled from a separate control box which allows synchronous switching of primary current and choice of welding programmes. Further types (BP-60; -80; -160;) are pneumatic spot welding machines with electronic control with a top output of 500 welds/min. and from 4+4 up to 8+8 mm thickness can be welded.

(b) Welding presses VUS 250 and VUS 1000.1 type are used for mass and lot production of parts of medium and large cross-sections which are welded by the resistance or flash welding process with an automatic working cycle.

(10) This paper does not deal with a detailed description of the particular techniques, but presents only a rough survey of some selected techniques which have been successfully used in this country.

(11) Progressive engineering technology secures a maximum increase in productivity with a minimum physical effort of man, reduces production costs and in the sum has a substantial effect on raising the standard of living, which is the goal of socialist society.

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